Overview - U.S. Army Institute for Water Resources

Planning Associates Washington Experience

Bob Pietrowsky, Director
USACE Institute for Water Resources
& the International Center for Integrated
Water Resources Management,
under
the auspices of UNESCO

8 March 2011

US Army Corps of Engineers
BUILDING STRONG®

About IWR

- Established: in 1969 to help Corps identify & adapt to the Nation's changing water resources needs.

- FOA – Physically & functionally distanced from HQ
  - ✓ Business model – wholly owned by CECW; purpose is to facilitate execution of CW mission – ie. - to serve the field practitioner
  - ✓ Offices at five locations, including two newly established in FY10
    - Main Office – NCR, Alexandria, VA
    - Waterborne Commerce Statistics Center – New Orleans
    - Hydrologic Engineering center – Davis, CA
    - Risk Management Center – opened 2010, Lakewood, CO, with Eastern Division office in Pittsburgh, PA

- People: ~ 200 FTE FY11 – Permanent staff generally with specialized technical skills, most with advanced degrees.

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IWR MISSION

INSTITUTE FOR WATER RESOURCES

To support Civil Works by: anticipating changes in national water resources conditions, and to develop, apply & infuse new planning evaluation, hydrologic engineering and program management policies, methods, tools and s address these needs.

- ***USACE CIVIL WORKS STRATEGIC PLAN – focused on sustainability & integrated water resources management***
- ***USACE Campaign Plan***
- ***Army Campaign Plan***

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Emerging Issues & Challenges

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What's Next?

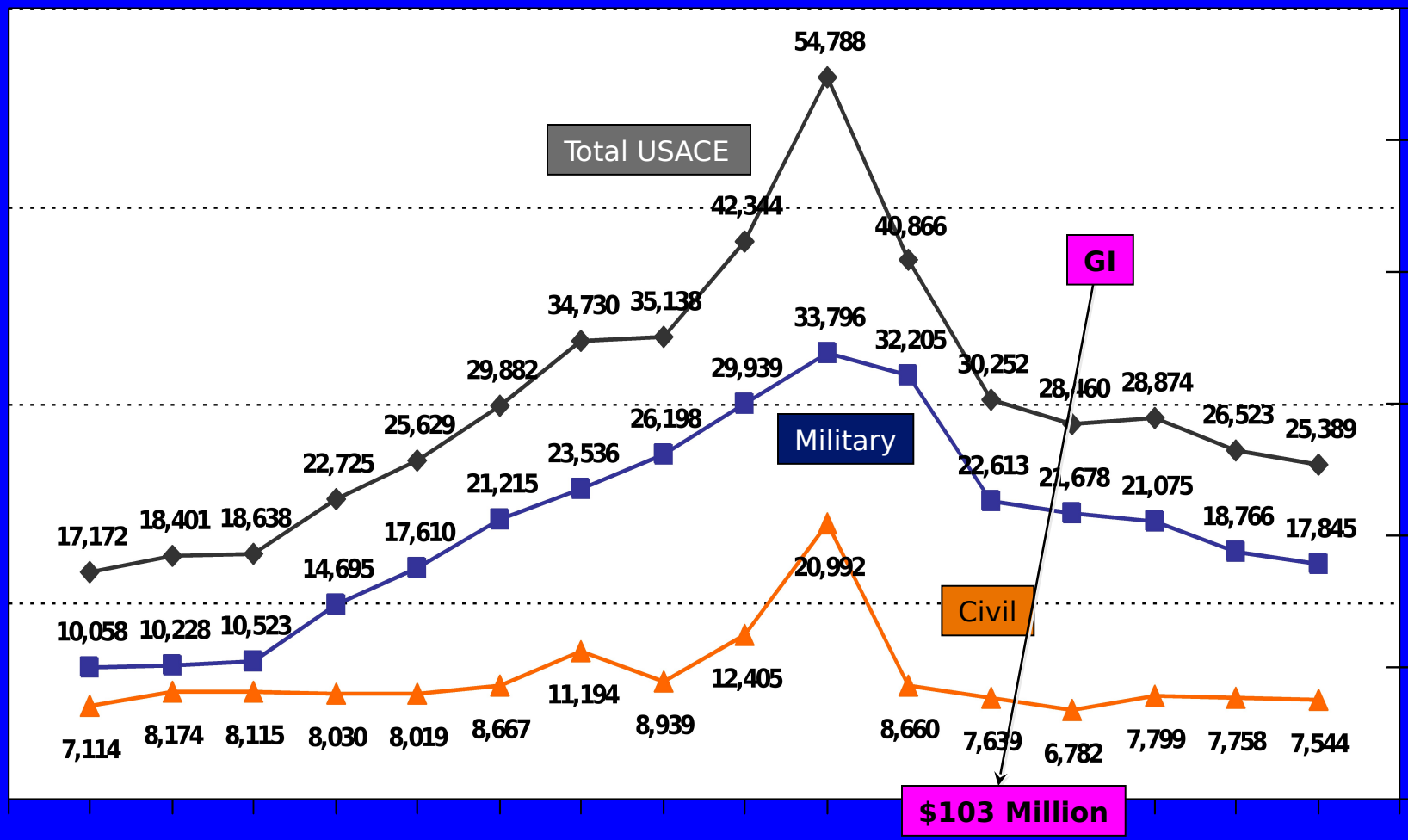
Future Of USACE CW Program

" END OF THE WORLD " AS CIVIL ORKS KNEW IT: A Continuing Story…

- NRC 216 Reports 2004 – Focus on Portfolio Mgt.
- CW Strategic Plan Released 2004
- 2nd & 3rd NRC Reports on Restructured Upper Miss Nav Study 2004, 2005
- Potential WRDA's 04, 05 Fail
- Hurricane's Katrina & Rita – 2005
- Good News - N.O.'s levee rebuild – Jun 2006
- Good News: IPET, ASCE ETR, HPDC
  Bad News: Prof's Bea & Seed Rpt, mixed news coverage
- Potential WRDA 2006 Fails
- Supreme Court Decision - *Carabell & Rapanos*
- Nat. Levee Invento & Assess, AFC – 2006-7
- WRDA 2007 Enacted!

- Wash Post Series Begins Jan 2000
- Upper Miss Nav Whistleblower 2000
- Army IG- Upper Miss Nav 2000
- 1st NRC Rpt on Upper Miss N 2001
- GAO Investigation - Delaware Deepening Project 2001
- Corps Reform Focus on H 2001
- Planning Excellence Program - 2001
- 9-11, Focus on Homeland Security
- GWT: Afghanistan 2002, Iraq 2003
- Potential WRDA's 02, 03 Failed

USACE Program Trends FY00-15



FY11 Constant $ (Oct 10) Military = MILCON, RDT&E, RE, Reimb, OCO, ARRA & FY09-10 Carryover Civil = Direct + Reim

An Evolving Focus… Topics Which are Influencing the Future CW Program

1) Focus on Sustainability - Watershed / IWRM Perspective, Collaborative Planning, implications of a revised P
2) Competition for Water, including Environmental Flows & Regional Water Supply Needs
3) Aging Infrastructure/Need for Recapitalization Program
4) Flood Risk Mgt. & lessons learned from Katrina
5) Climate Change Adaptation & the Water-Food-Energy Nexus
6) Federalism Shift Increasing Water Leadership by States
7) Intersection of International Water Security & USACE OCONUS Missions
8) Globalization - Waterborne Trade Implications, Homeland Security International Water Resources, Expansion of Panama Canal
9) Post-Stimulus Constrained Domestic Discretionary Funding (begin FY11)

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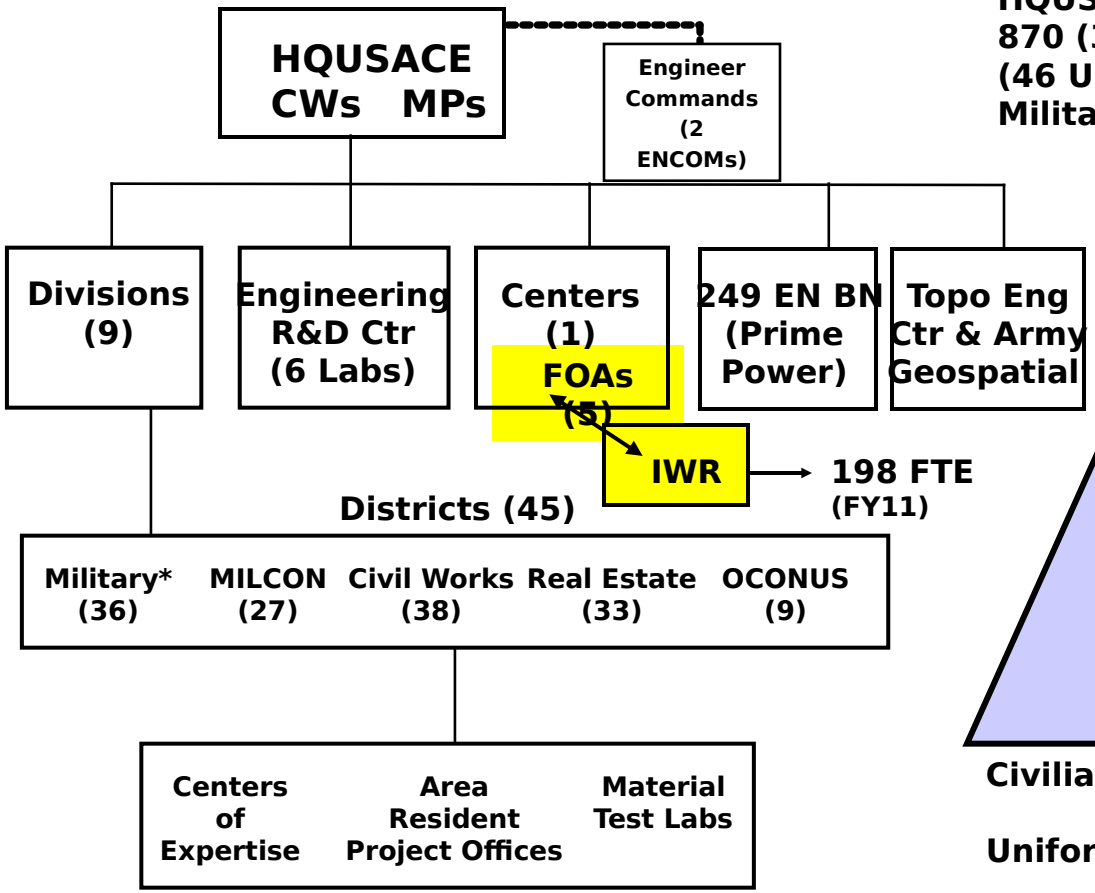
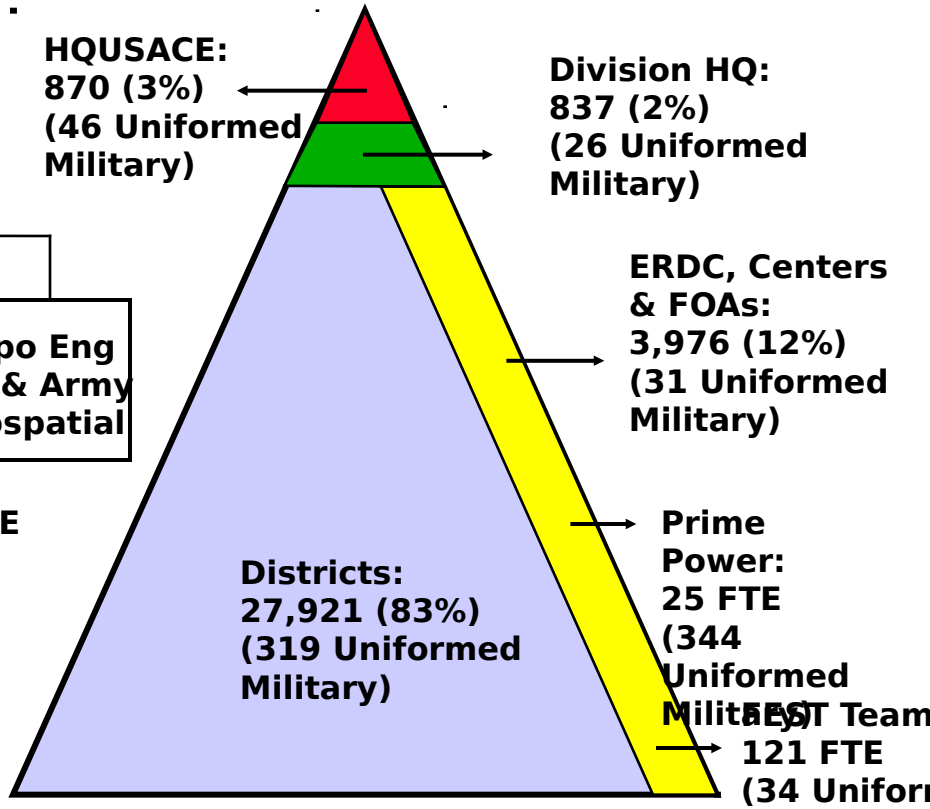
USACE in FY11

USACE Organization



Distribution
Civilian FTE/Uniformed End Strength (ES)


HQUSACE: 870 (3%) (46 Uniformed Military)
Division HQ: 837 (2%) (26 Uniformed Military)
ERDC, Centers & FOAs: 3,976 (12%) (31 Uniformed Military)
Prime Power: 25 FTE (344 Uniformed Military)
Districts: 27,921 (83%) (319 Uniformed Military)
EEST Team
121 FTE
(34 Uniform
Military)

Civilians: 33,750 FTE Allocated

Uniformed: 800 Authorized (Officer/Enlisted)

Data as of Nov 09 *MIL=MILCON,DERP,RE FOAs=HECSA,IWR,MDC,UFC,ULA **Includes 36 for GRD thru FY11

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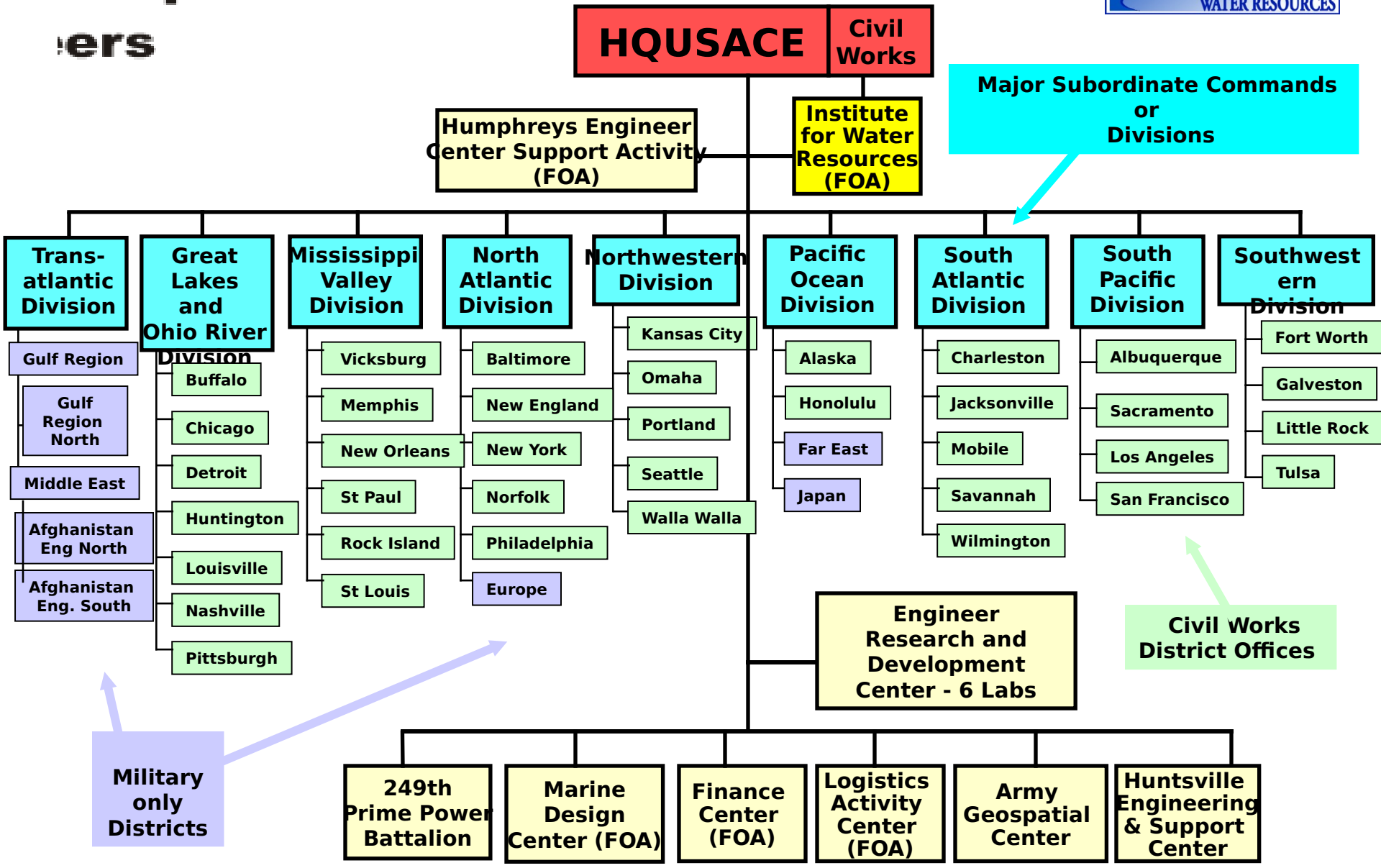
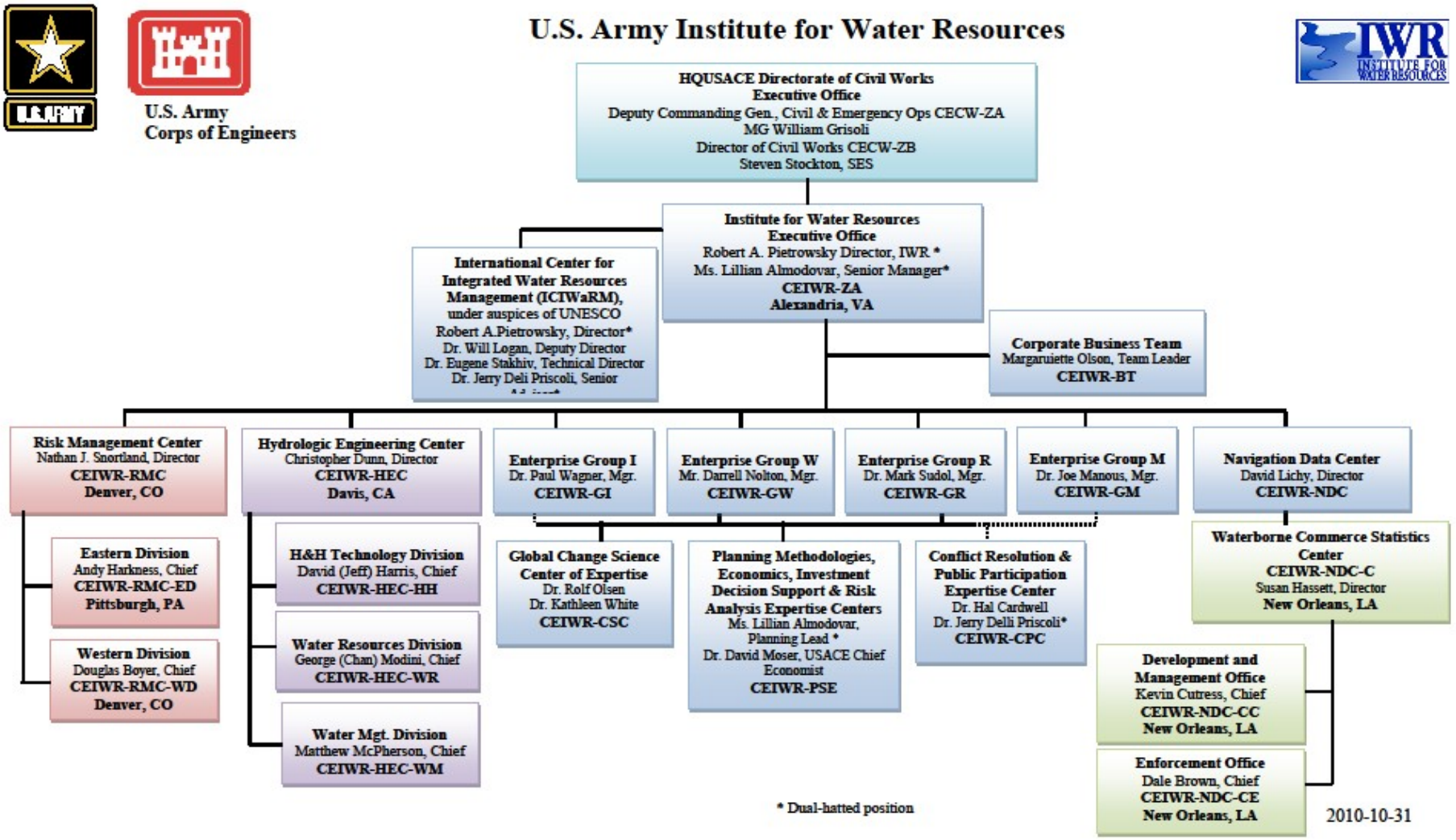
USACE Organization



U.S. Army Institute for Water Resources



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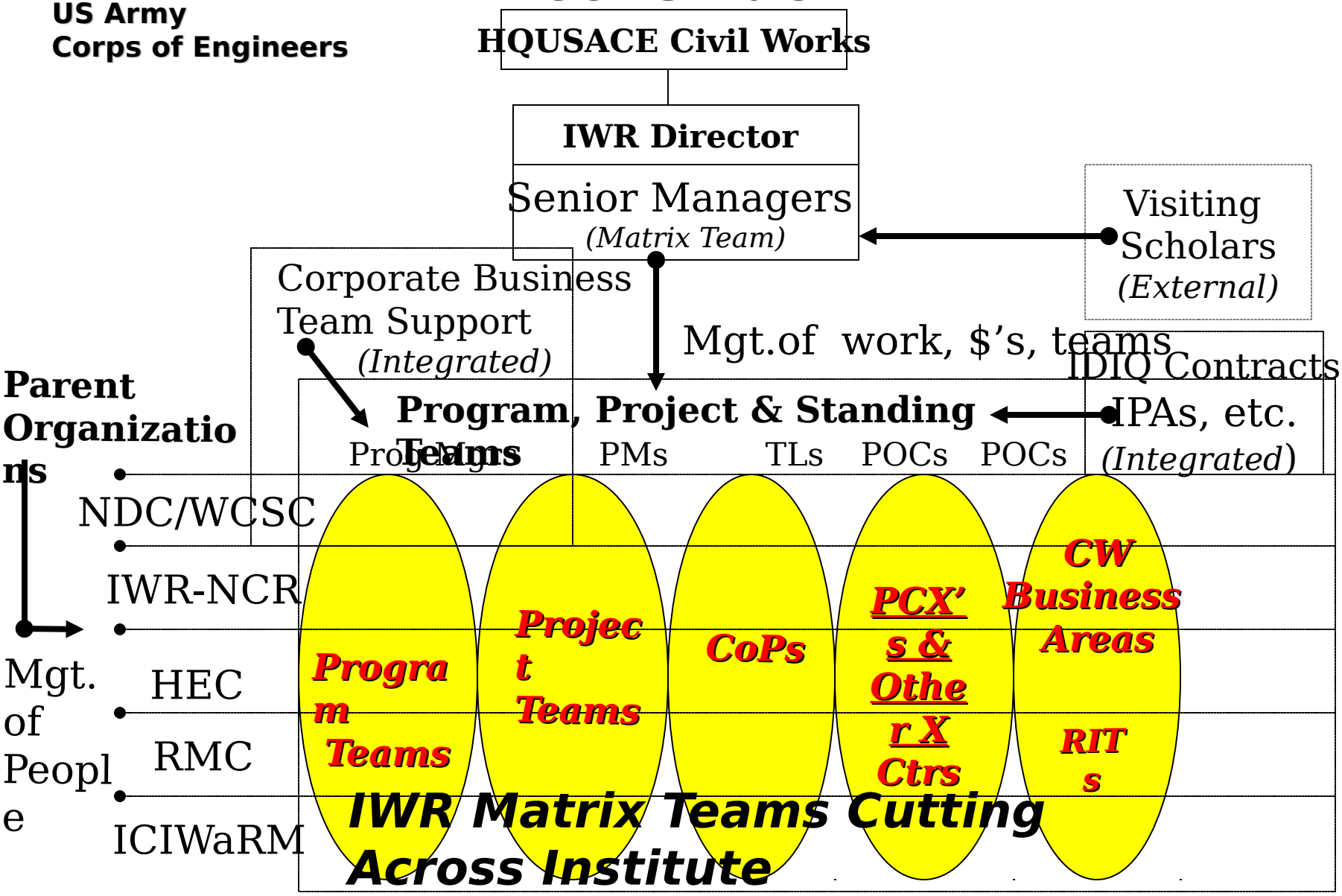
US Army
Corps of Engineers

IWR Organizational Construct



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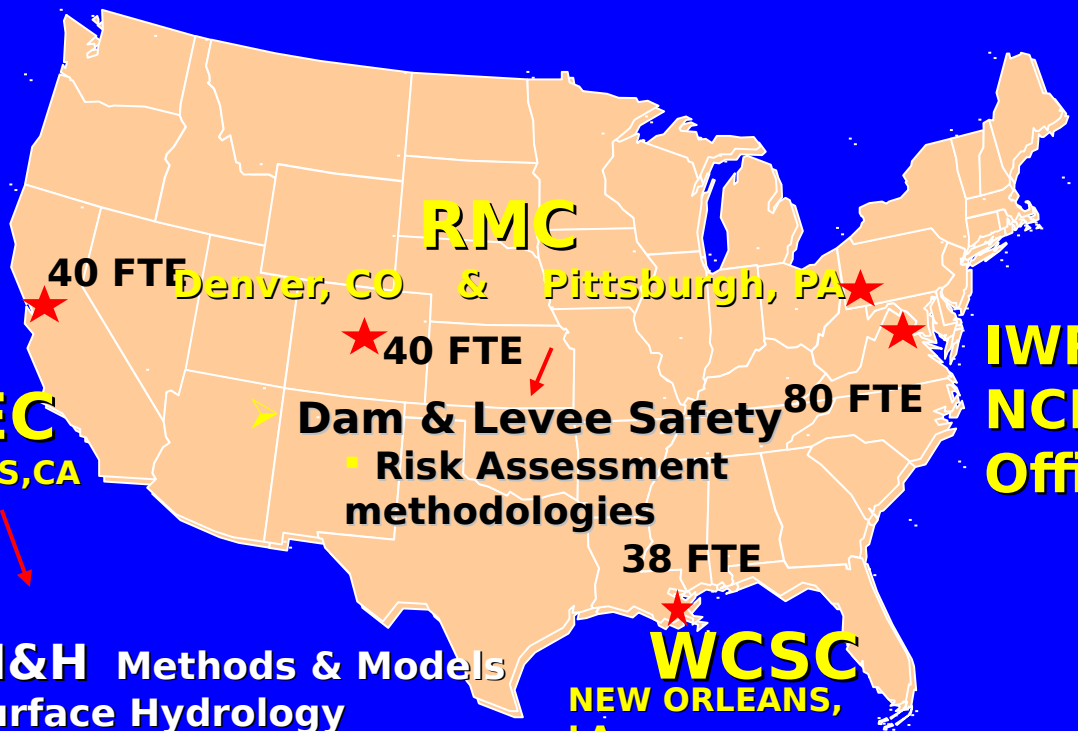
IWR OFFICES & MISSION SPECIALTIES

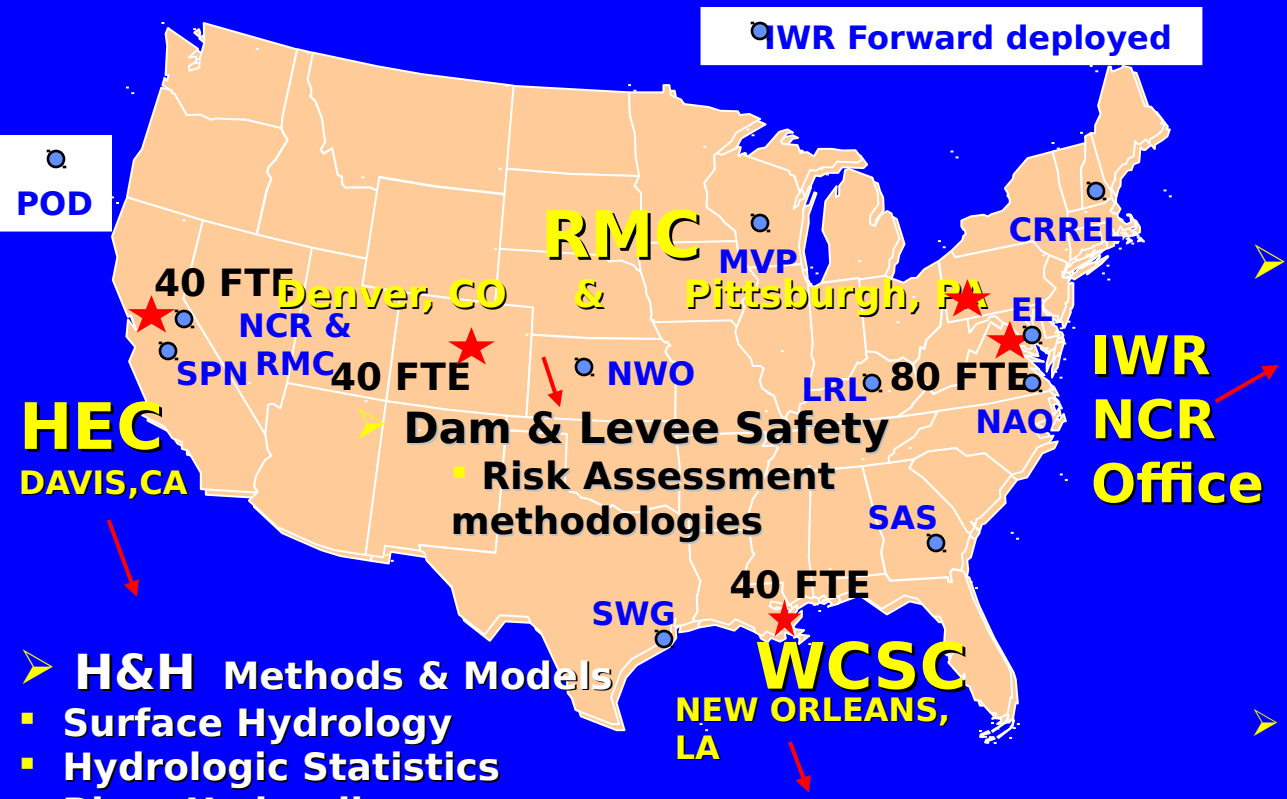
IWR INSTITUTE FOR WATER RESOURCES



- **Program Direction**
  - Water Resource Trends & Emerging Issues
  - Support on CW Strategic
  - Policy Development Supp
  - National Studies
- **Problem Solving**
  - Investment Decision Supp Methods & Models
  - Multi-Objective/IWRM
  - Plan Formulation
  - Socio-Economic Analyses
  - Environmental Evaluation
  - Global Climate Change
  - Technical Assistance & Capacity Development
- **Partnering**
  - Collaborative Planning
  - Public Involvement
  - Alternative Dispute Resol
  - National Interface
  - International Outreach

- **Dam & Levee Safety**
  - Risk Assessment methodologies
- **H&H** Methods & Models
  - Surface Hydrology
  - Hydrologic Statistics
  - River Hydraulics
  - Ecosystem Function Models
  - River Forecasting
  - Reservoir Systems & Water Mgt
- **Waterborne Commerce Statistics**
  - Foreign Trade
  - Domestic Commerce
- **Navigation Infrastructure**
- **Dredging & Lock Performance**

IWR OFFICES & MISSION SPECIALTIES



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USACE Campaign Plan: WR Focus Cuts Across all Four Goa

Goal 1:
Deliver USACE support to combat, stability and disaster operations through forward deployed and reach back capabilities.

- **Objective 1a:** USACE is ready, responsive and reliable in delivering high performance, all-hazard, contingency mission execution in a world-wide theater of operations.
- **Objective 1b:** Prepare Theater Engineer Commands (TEC) to support Combatant Cdr's throughout the spectrum of operations.
- **Objective 1c:** Establish human resources and family support programs that promote readiness and quality of life.
- **Objective 1d:** Institutionalize USACE capabilities in interagency policy and doctrine.

Goal 2:
Deliver enduring and essential water resource solutions through collaboration with partners and stakeholders.

- **Objective 2a:** Deliver integrated, sustainable, water resources solutions.
- **Objective 2b:** Implement collaborative approaches to effectively solve water resource problems
- **Objective 2c:** Implement Streamlined and Transparent Regulatory Processes to Sustain Aquatic Resources
- **Objective 2d:** Enable Gulf Coast Recovery.

Goal 3:
Deliver innovative, resilient, sustainable solutions to the Armed Forces and the Nation.

- **Objective 3a:** Deliver sustainable infrastructure via consistent and effective military construction & real estate support to customers.
- **Objective 3b:** Improve resilience and lifecycle investment in critical infrastructure.
- **Objective 3c:** Deliver reliable infrastructure using a risk-informed asset management strategy.
- **Objective 3d:** Develop and apply innovative approaches to delivering quality infrastructure.

Goal 4:
Build and cultivate a competent, disciplined, and resilient team equipped to deliver high quality solutions.

- **Objective 4a:** Identify, develop, maintain, and strengthen technical competencies in selected Communities of Practice.
- **Objective 4b:** Communicate strategically and transparently.
- **Objective 4c:** Standardize business processes.
- **Objective 4d:** Establish tools and systems to get the right people in the right jobs, then develop and retain this highly skilled workforce.

Alignment w/CW's Priorities

- **Civil Works Top Seven Priority Actions**
  - ✓ **Transforming the Civil Works Program to Meet 21st Century Needs** - New Budgeting Paradigm, Collaboration, 18 mth Feasibility Study, P&G Revision, WRDA 2007 Implementation & Preparing for Next WRDA
  - ✓ Flood Risk Management – incl National FRM Program & Silver Jackets
  - ✓ Contingency Planning and Response – focus on International Water Resources, Water Security, technical support Iraq, Afghanistan, Pakistan
  - ✓ Watersheds and Systems - includes Watershed Investment Decision Tool, planning guidance and tools, IWR Planning Suite, HEC-WAT
  - ✓ Strategic Management of Civil Works Information – Data and information in support of CW Performance Mgt., Budget

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IWR WORKFORCE

IWR INSTITUTE FOR WATER RESOURCES

IN-HOUSE INTERDISCIPLINARY STAFF

- At Main Office, concentration of
  - ✓ Economists
  - ✓ Social Scientists
  - ✓ Planners
  - ✓ Physical Scientists
  - ✓ Computer System Analysts
- Also including
  - ✓ Civil Engineers
  - ✓ Prog/Project Managers
  - ✓ Administrative Support
- At HEC, Hydraulic Engineers
- At RMC, Engineers
- At WCSC, Statisticians

EXTERNAL RESOURCES – FORCE MULTIPLIER

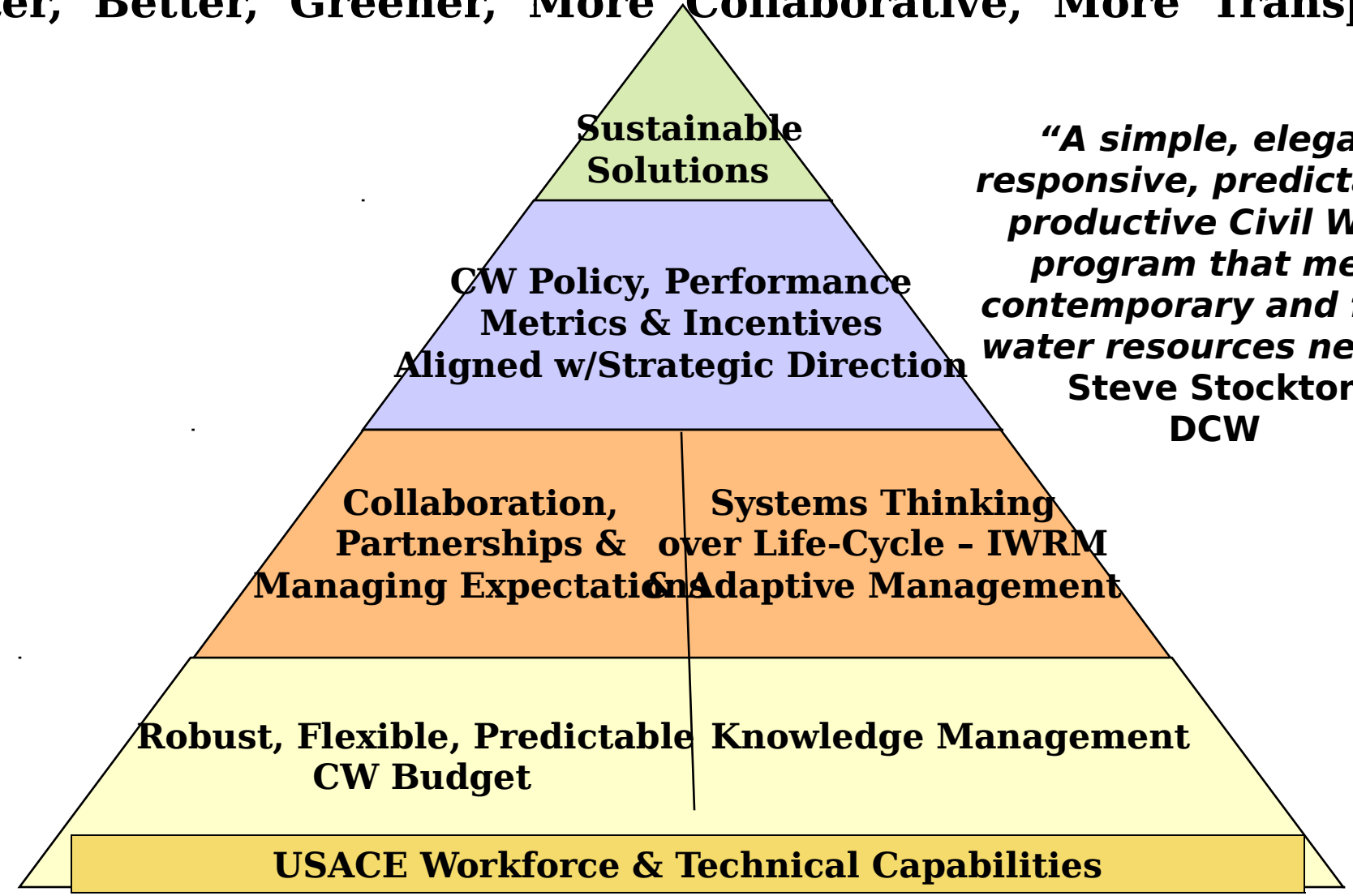
- Consulting Firms
- Intergovernmental Personnel (IPA) Act
- Details From Other USACE
- NRC Research Associate Program
- Presidential Mgt. Fellows
- Academia/Visiting Scholar
- Interagency Agreements
- AAAS Fellow Program

Representative Work: Partnering

- USACE Partnership Agreements
  - MSC Planning XCtrs – incl: FDR (SPD), Inland Nav (LRH), Deep-Draft Nav (SAM) & Ecosystem Restoration (MVD)
- Interagency Collaborations
  - DOI – USGS, Bureau of Reclamation
  - Commerce – NOAA, NWS, National Drought Information Center (NDIC)
  - DOT – Tech support to CMTS
  - Treasury – US Customs, IRS
  - Department of Agriculture – NRCS, Economic Research Center (
  - DHS/FEMA – Silver Jackets Program, Intergovernmental Levee Committee, FEMA MapMod & RiskMap, USCG
  - DOE National Laboratories – Oak Ridge, Sand
  - The Nature Conservancy
  - ASCE EWRI, COPRI

Corps ers .vil Works Program Modernizatio

ter, Better, Greener, More Collaborative, More Transparent,


Sustainable Solutions
CW Policy, Performance Metrics & Incentives Aligned w/Strategic Direction
Collaboration, Partnerships & Managing Expectations
Systems Thinking over Life-Cycle – IWRM & Adaptive Management
Robust, Flexible, Predictable CW Budget
Knowledge Management
USACE Workforce & Technical Capabilities

"A simple, elegant, responsive, predictable & productive Civil Works program that meets contemporary and future water resources needs."

Steve Stockton, USACE DCW

Corps ers Cultural Change - New Think g

Focus	From	To
• SUCCESS =	• Projects	• Integrated solutions & Sustainability
• CRITERIA =	• NED benefits 1st	• More balanced NED, RED, EQ, OSE benefits
• WORK =	• Stay in your functional lane	• Seek horizontal integration
•KNOWLEDGE	• Knowledge is power	• Share knowledge
• STYLE =	• Follow SOPs as recipes	• Think creatively, consider risks, think systems
• FUNDING =	• Only Corps $'s	• Leverage resources
•LIFE CYCLE	• Plan, design, build, operate, maintain & rehab	• Plan, perhaps participate in implementing, but w/adaptive mgt (monitor over life cycle)

Contemporary Imperative to Collaborate

New York Times OP-ED Column – "How You Do Things Matters" , October 14, 2008

Tom Friedman

- **Provides good summary of why trend towards collaboration is inevitable as our world (and our work, businesses, etc.) become more interconnected.**

- **Friedman argues that in our hyper- connected and transparent world, how you do things matters more than ever, because so many more people can now see how you do things, be affected by how you do things and tell others how you do things on the Internet anytime, for no cost and without restraint.**

- **In a connected world, the character of countries, governments & companies are on display - how they work, how they keep promises, how they make decisions, how things really happen inside, how they relate to their customers, to the environment & to the communities in which they operate.**

- **Freidman argues that given this inter-connectiveness, collaboration is the key to success – an agency's commitment to making decisions in a transparent, open & forthright manner ultimately reveals it's character.**

Collaborative Engagement: Paradigm Sift Towards Righ

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IWR INSTITUTE FOR WATER RESOURCES

Procedural, Technical & Cultural Transformation

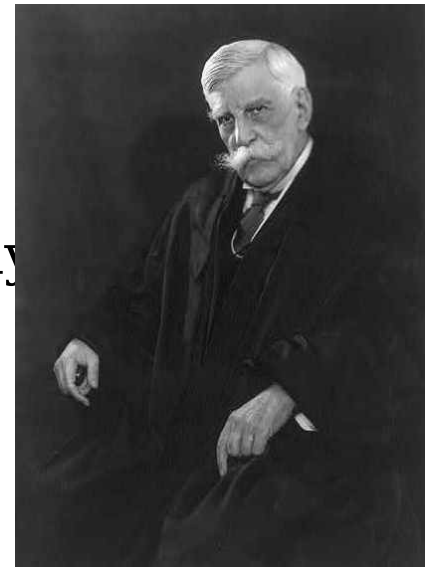
Collaborative Problem Solving

Two-way, transparent dialogue with stakeholders

Engagement Approach **Inform → Consult → Involve → Collaborate → Empower**

Corps ers Washington Post Op-Ed Article on U.S. Foreign Policy - 1 Dec 0

- Quotes **Justice Oliver Wendell Holmes**, “that a relationship between any two “actors” really involves six "persons":
  - Each actor's self-image,
  - Each actor's image of the other and, finally
  - What each actor actually is.”



- Relevance to USACE:
  - In some instances there’s a clear disconnect between Corps self-image as great collaborators versus how we’re seen by other “actors”
  - G2G – Confront the brutal facts, incl wrt perceptions

What is Shared Vision Planning?

- Shared Vision Planning (SVP) is a collaborative approach to formulating water management solutions that combines three disparate practices:

  - ✓ 1) Traditional water resources planning, within a contemporary IWRM context,

  - ✓ 2) Active and open public participation, structured to suit the setting,

  - ✓ 3) Technical transparency thru collaborative computer modeling.

- The desired outcome is technically informed, timely, and usually, more robust decisions, with less conflict

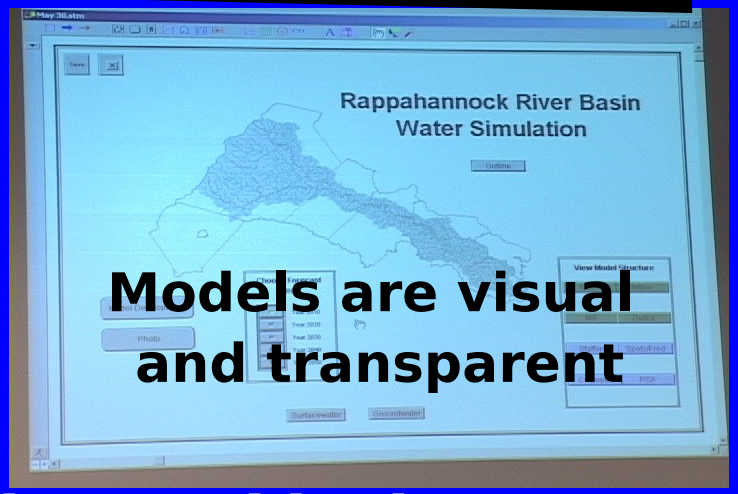
- Although each of these elements have each been successfully applied with traditional approaches, what makes SVP unique is the

Collaborative Decision-Making & IWRM: Shared Vision Planning

- Process of “technically informed" consensus building.
- Links IWRM Collaboration directly to civil society and the people
- Models are built collaboratively & accessible to all stakeholders.
- Public and experts work together to build models and supply data.
- Stakeholder concerns are directly incorporated into models.
- Particularly useful in trans-boundary and high-conflict cases.

Shared Vision Planning

International Lake Ontario - St. Lawrence River Study



Representative Work: Capacity Building

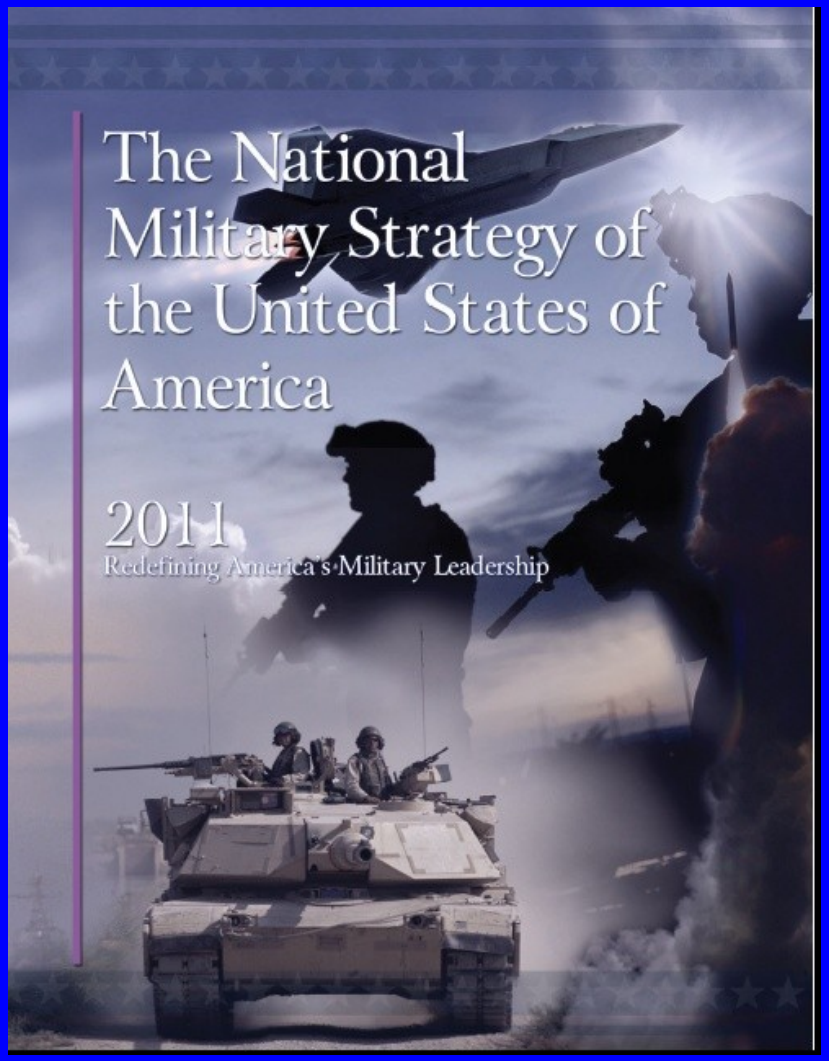
- Training, Education & Technology Transfer
  - ✓ Deliver 20 –25 Water Resources "short courses" (each 1 - 2 weeks duration) annually from portfolio of ~ 30 training courses
  - ✓ Also provide customized training on reimbursable basis

- Negotiating, Conflict Mgt & ADR
- Public Involvement, Comm. & Conflict Prevention
- Water Quality & Wetlands Regulatory Policies
- Regulatory Decision Making & Executive Seminar
- Economic Analysis for Water Resources Planning
- Ecosystem Restoration Planning and Evaluation
- Water Supply Forecasting with IWR-MAIN
- Flood Damage Analysis - HEC-FDA
- IWRM & Watersheds
- Shared Vision Planning
- Risk Analysis for Water Resources Planning & Mgt.
- Risk-Based Analysis for FDR Projects
- Water Quality Management
- Flood Warning Preparedness System Planning
- Hydrologic Model System (HEC-HMS)
- River Hydraulics with HEC-RAS
- Advanced Flood Hydrology Applications
- GIS in Hydrologic Engineering
- Flood Frequency Analysis HEC-FFA
- Statistical Methods in Freq. Analysis
- Unsteady Flow HEC-RAS and UNET
- Groundwater Hydrology Modeling
- Water Mgt. and Operations with CWMS
- Hydrologic Data Mgt with HEC-DSS

Representative Work: Capacity Building (Cont'd)

- Planning Associates Program
  - Technical and admin support to CECW for the 10 month program aimed at developing cadre of senior-level water resources planners

- Water Resources Masters Degree Program – Developed in partnership with U.S Universities Council on Water Resources (UCOWR)
  - Initially established at five Universities:
    - **University of Florida**
    - **Johns Hopkins University**
    - **University of Arizona**
    - **Southern Illinois University**
    - **Harvard University**
  - Program is open to students with undergraduate degrees in engineering/science, with applicants expected to possess substantial professional experience in water resource-related field.



Strategic Environment……

Population growth and urbanization in the Middle East, Africa, and South Central Asia will contribute to ***increased water scarcity*** *and may present governance challenges. The uncertain impact of* ***global climate change*** *combined with increased population centers in or near coastal environments may challenge the ability of weak or developing states to* ***respond to natural disasters.***

Page 2, The National Military Strategy of the United States of America, 8 February 2011

Organizational Structure
International Center for Integrated Water Resources Management (ICIWaRM)

ICIWaRM

Under the auspices of UNESCO

United Nations Educational, Scientific and Cultural Organization

International Center for Integrated Water Resources Management

Welcome

About the Center

- About ICIWaRM
- Mission
- News and Events
- Projects
- Program
- Core Organizations
- UNESCO Water Centre

News: IWR Signs Memorandum of Understanding with Florida International University

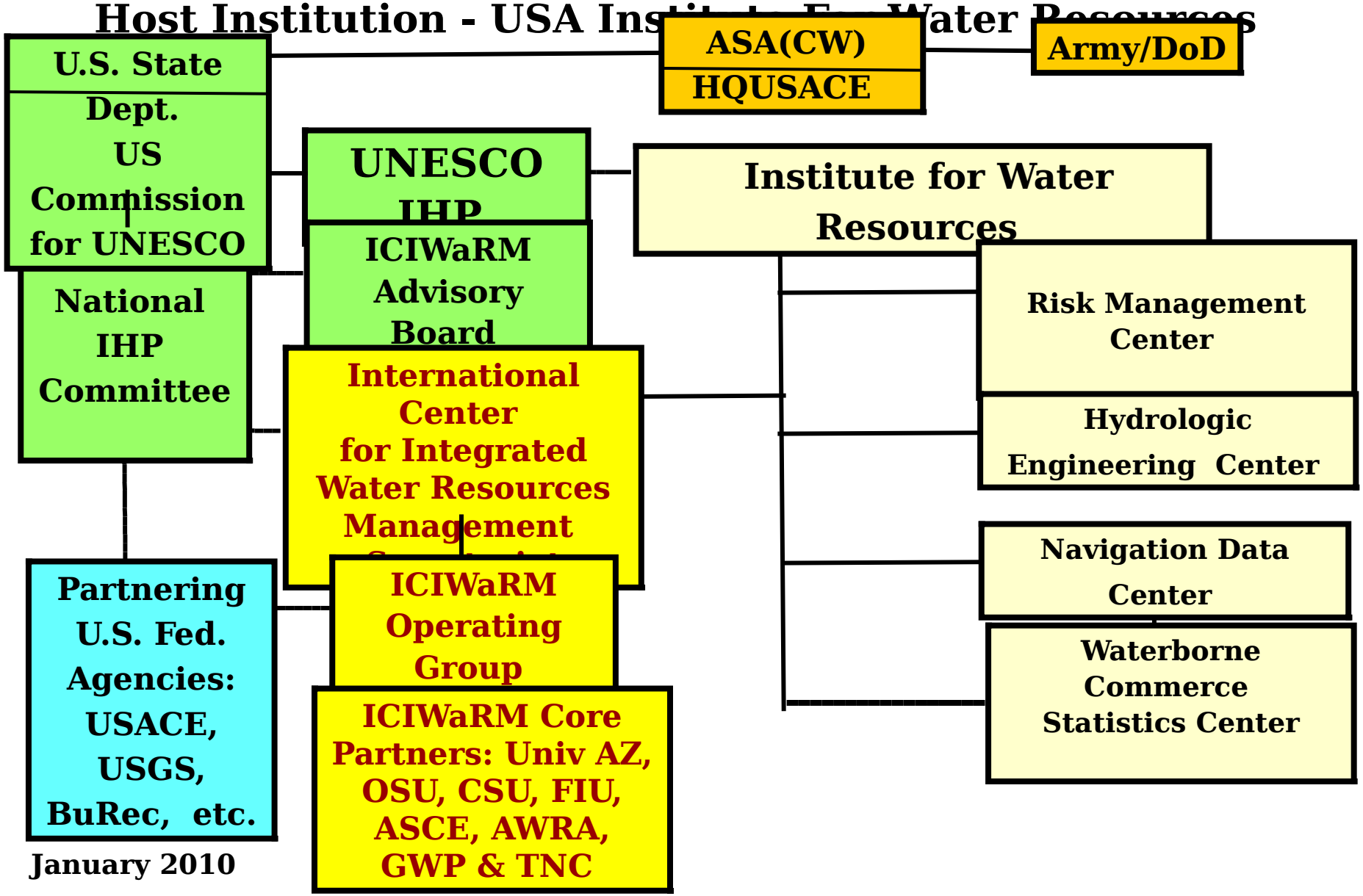
The **International Center for Integrated Water Resources Management (ICIWaRM)** was established and funded by the U.S. Army Engineer Institute for Water Resources (IWR) in 2007 in collaboration with U.S. institutions and organizations sharing an interest in the advancement of the science and practice of integrated water resources management (IWRM) around the globe.

ICIWaRM's water science node is led by an academic consortium headed by the University of Arizona, and includes partnerships with the Universities of New Hampshire, Oregon State, Florida International, and Colorado State.

UNESCO's water family

- UNESCO Water Sciences Program
- International Hydrological Programme (IHP)
- UNESCO-IHE
- World Water Assessment Programme (WWAP)

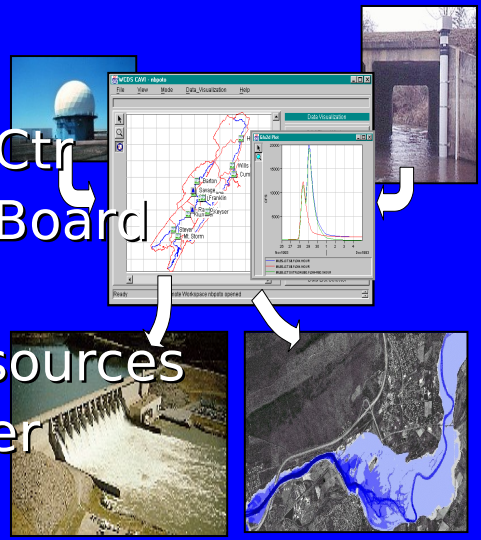
Organizational Structure
International Center for Integrated Water Resources Management (ICIWaRM)
Host Institution - USA Institute For Water Resources


ASA(CW)
HQUSACE
Army/DoD
U.S. State Dept. US Commission for UNESCO
UNESCO IHP
Institute for Water Resources
ICIWaRM Advisory Board
National IHP Committee
International Center for Integrated Water Resources Management
Risk Management Center
Hydrologic Engineering Center
Navigation Data Center
Waterborne Commerce Statistics Center
Partnering U.S. Fed. Agencies: USACE, USGS, BuRec, etc.
ICIWaRM Operating Group
ICIWaRM Core Partners: Univ AZ, OSU, CSU, FIU, ASCE, AWRA, GWP & TNC

January 2010

Representative Work: International Partnering

- Secretariat for US Section of PIANC – International Navigation Association
- International Joint Commission (IJC) –
  - ✓ Lake Ontario & St. Lawrence River Study
  - ✓ Upper Great Lakes Study
- USACE Rep on U.S. National IHP Committee
- USG Rep on Governing Board IHE/Delft
- USG Rep on Advisory Board of ICHARM UNESCO Ctr
- Columbia River Treaty – Permanent Engineering Board
- World Water Council & the series of WWF's
- Technical support on Iraq, Afghanistan Water Resources
- USACE IWR – ICIWaRM as global U.N. water center
- Current Partnership Agreements include:
  - ✓ UNESCO-International Hydrological Program (IHP & IHE-Delft)
  - ✓ Dutch Rijkswaterstaat, Japan Ministry of Land, Infrastruct & Transport
  - ✓ Mexico National Autonomous University (UNAM)



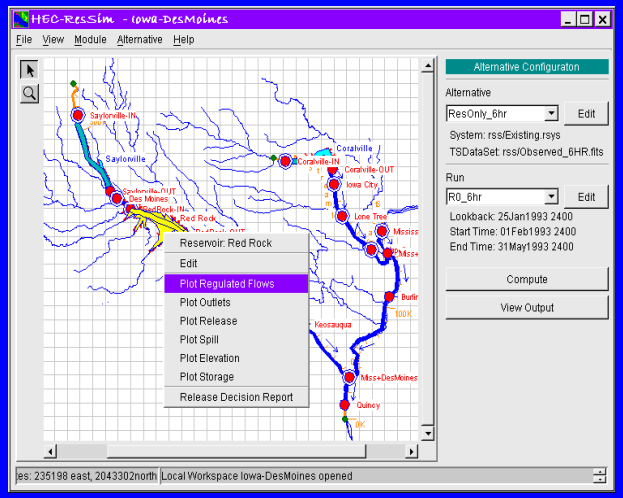
Representative Work: Problem Solving

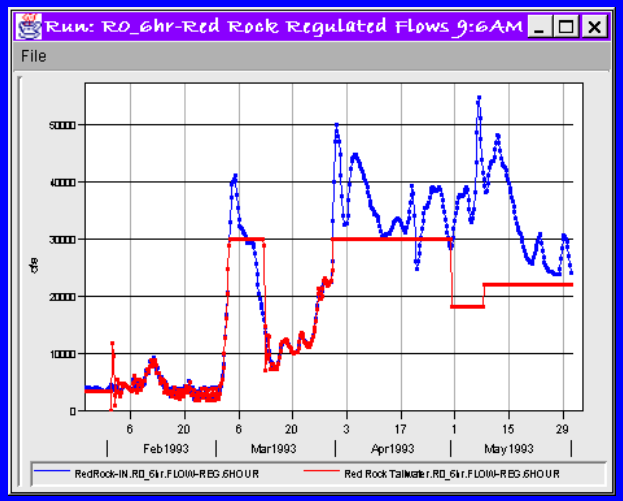
- Technical Methods & Models
  - Planning Model Improvement & Certification
  - Revision of the P&G, NED Manual Updates
  - Planning Tools: IWR-Planning Suite – Version 2.0 just released
  - GUMP Program – Technical Support to CECW
  - Hydrologic Engineering Center (HEC) Suite of NexGen Software
- Research & Development
  - Navigation Economic Technologies (NETS)
    - HarborSym, NaSS, Global Grain Model, etc.
    - Multi-modal Freight System Analysis
  - Decision Methodologies
    - Risk-Informed Planning Framework
  - Hydrologic Engineering:
    - CWMS - Water Management
    - HEC-ResSim

Representative Work: Problem Solving

- Post Katrina Initiatives
  - IPET & HPDC & “Actions for Change”
  - Risk-Informed Planning Framework LaCPR
- Regulatory Support Program
  - ORM2; Mitigation Banking
  - Federal Compensatory Mitigation Rulemaking:
  - Water Supply Permitting; Watershed Approach;
  - Cumulative Impacts; Shared Vision Planning
- Watershed Investment Decision Tool (WIDT)
  - Enterprise GIS, multi-layered decision tool across USACE CW’s programs, using watershed/systems approach & founded on CorpsMap technology
- National Flood Risk Management Implications
  - National Levee Inventory, Levee Certifications & Condition Assessments
  - National Flood Risk Management Program

H & H Engineering Software

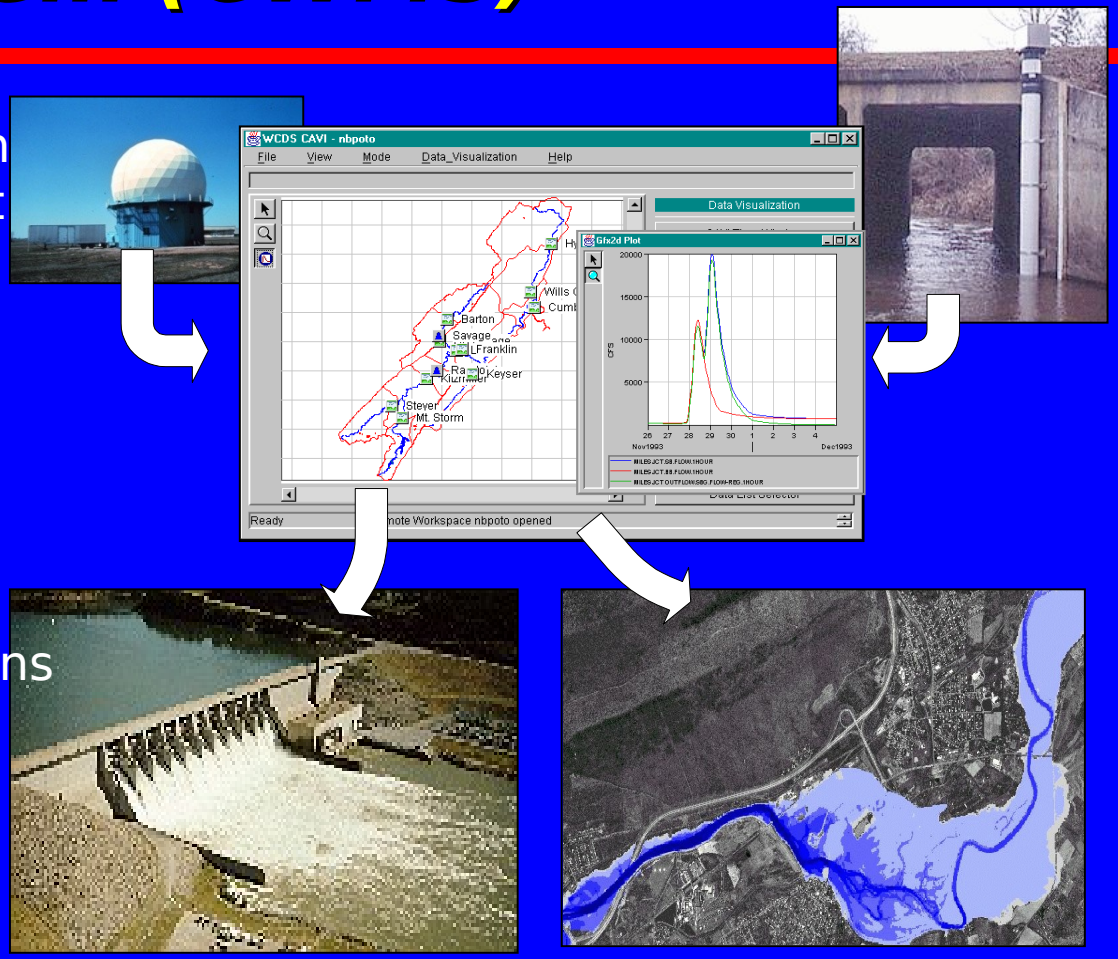




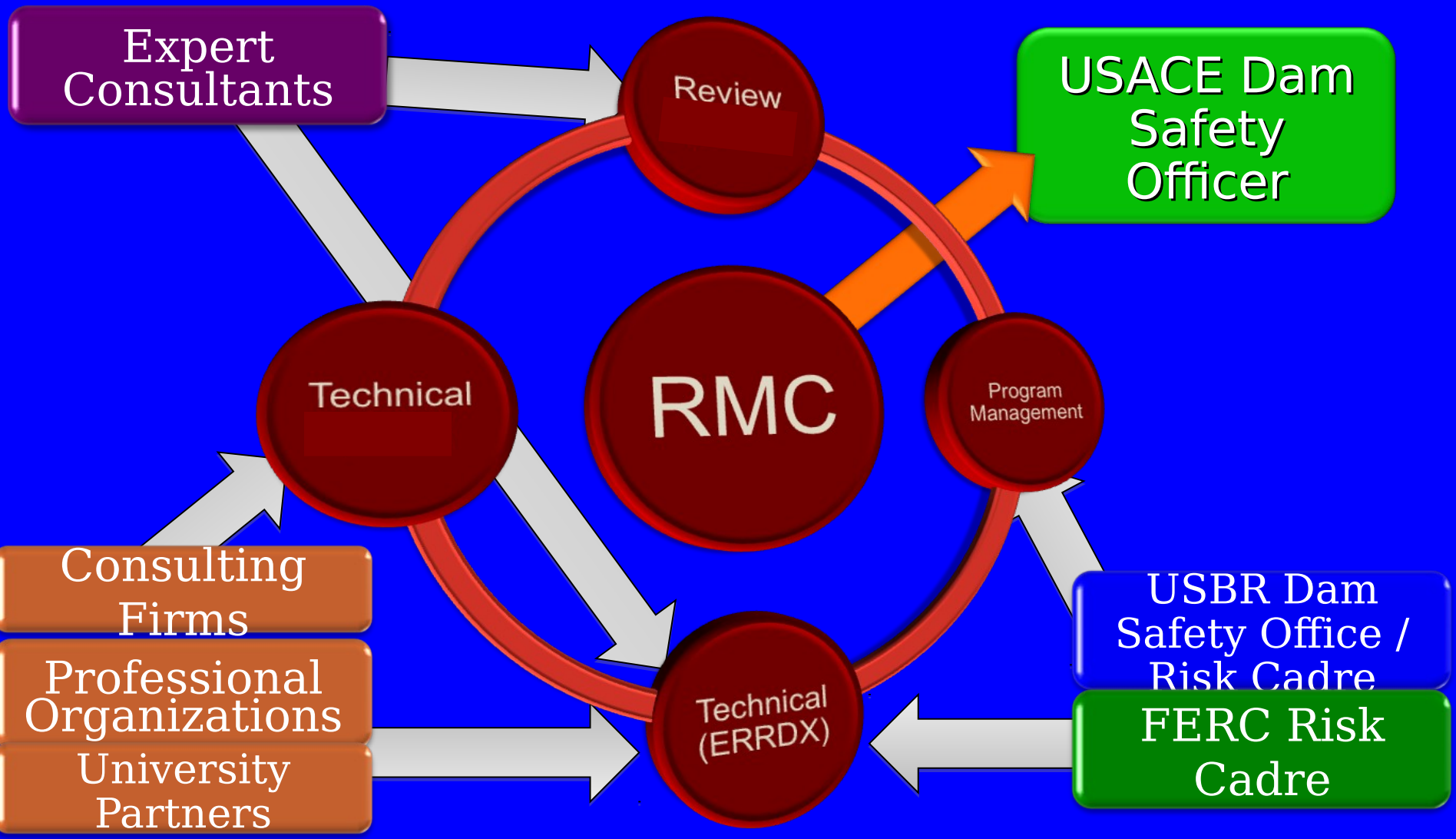
- NexGen Program Suite
  - ✓ Watershed hydrology with HEC-HMS 3.3
  - ✓ Statistical software package HEC-SSP 1.1
  - ✓ River hydraulics with HEC-RAS 4.0
  - ✓ Reservoir analysis with HEC-ResSim 3.0
  - ✓ FDR analysis with HEC-FDA 1.2.4
  - ✓ FRM Systems analysis w/ HEC-FRM
  - ✓ Flood impact analysis w/ HEC-FIA
  - ✓ Regime prescription tool - HEC-RPT (w/TNC)
- System Integration: CWMS & HEC-RTS
- Watershed Assessment Tool: HEC-WAT
- Ecosystem Functions: HEC-EFM 1.0

Corps Water Management System (CWMS)

- Improved Real-Time Decision Support for Water Management
- System for managing regulation of 500+ Corps Multipurpose Reservoirs & Flow Control Structures
- Integrated suite of real-time forecasting, modeling, operations and impact analysis models
- Expanded Corporate Web-Based Information
- Expanded deployment via ARRA during FY 2009/2010



IWR - Risk Management Center



Representative Work: Civil Works Information

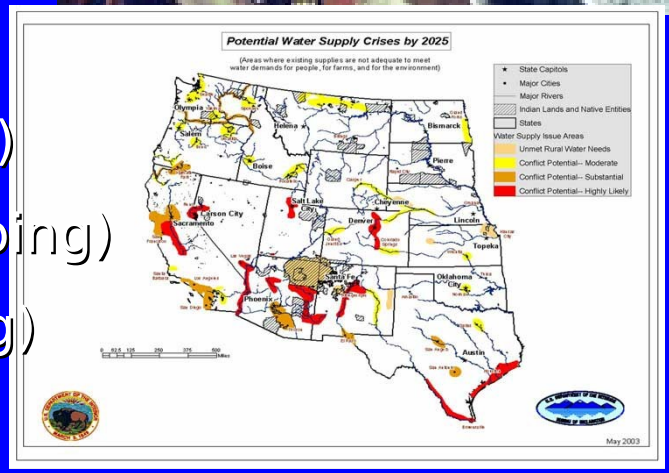
- National Information Systems
  - ✓ USG Agent for Collection & Management of U.S. Waterborne Commerce Statistics
  - ✓ Lock Performance Monitoring System
  - ✓ Dredging Information System
  - ✓ Operations and Management Business Information Link (OMBIL)
    - Performance management & measurement information across Civil Works business areas

Representative Work: Program Direction

- Policy & Program Development Initiatives
  - ✓ Civil Works Strategic Plan (2011-2015) – to be released by OMB Feb 11
  - ✓ Water Resources Future Trends, Outlook Papers, Forums, Roundtables
  - ✓ Building Strong Collaborative Relationships for a Sustainable Future
  - ✓ Water Policy Development – support to CECW & OASA(CW)
    - Support CW development of policies, procedures, P&G Revision
    - OSTP Committee on Environment & Natural Resources
      - Sub-Committee on Water Availability & Quality (SWAQ)
    - CEQ/OSTP Committee on Adaptation to Climate Change
      - Lead USACE participation on eleven Working Groups – incl: Science, Water, Adaptation Processes

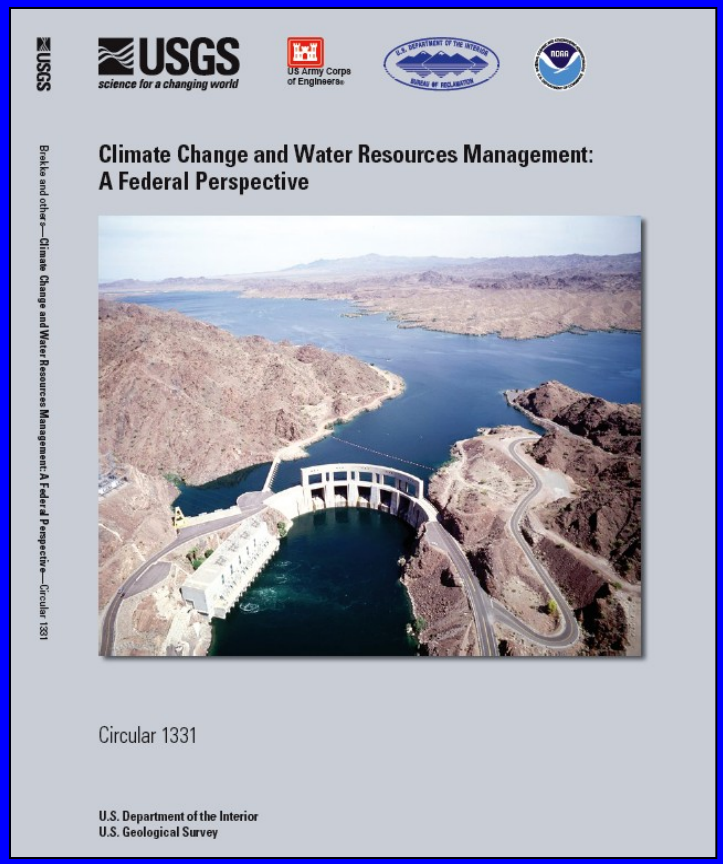
Representative Work: Program Direction

- National Scope Studies & Programs
  - ✓ IPET-HPDC & USACE Campaign Plan Actions
    - Comprehensive Systems, Risk Analysis
    - Risk Communication, Technical Competency
  - ✓ National Flood Risk Management (ongoing)
    - Silver Jackets Program (ongoing)
  - ✓ Flood Damage Data Program (ongoing)
  - ✓ Transportation Systems Program (ongoing)
  - ✓ National Shoreline Mgt. Study (ongoing)
  - ✓ National Drought Study
  - ✓ National Mitigation Banking Study
  - ✓ Federal Infrastructure Strategy
  - ✓ National Hydropower Study
  - ✓ National Waterways Study



Interagency Workgroup on Climate Change

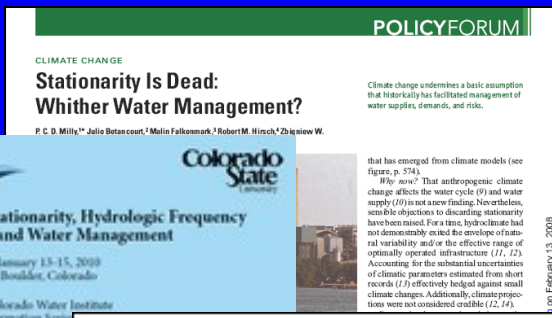
- The four major US water resources agencies:
  - USACE, U.S. Geological Survey, Bureau of Reclamation, National Oceanic and Atmospheric Administration
- Mission:
  - To evaluate practices of federal agencies to incorporate climate change considerations into activities related to Nation's water resources
  - Provide foundation for future policies, methods, research, etc.
- Report released as USGS Circular 1331 February 2009

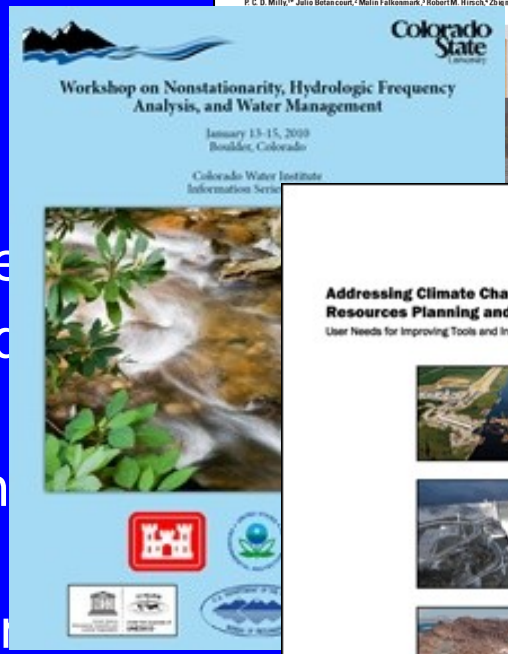


http://pubs.usgs.gov/circ/1331/

Evolution of Thinking About Water & Climate

- Stationarity paradigm – future will look like the past? ***Not Likely!***
- Recognized role of cyclical climate changes:
  - ✓ El Nino
  - ✓ Pacific Decadal Oscillation
  - ✓ Atlantic Multi-Decadal Oscillation
- IWRM is the accepted paradigm / conte
  for dealing with climate adaptation and
  adaptive management
- Transitional pragmatic evaluation, plan
  and engineering design tools
  needed in absence of good informatio
  from GCMs and forecasting models
- ***USACE led International Climate Workshop***
- ***on Alternatives to Stationarity – Jan 2009***




Colorado State University
Workshop on Nonstationarity, Hydrologic Frequency Analysis, and Water Management
January 13-15, 2009
Boulder, Colorado

Addressing Climate Change in Long-Term Water Resources Planning and Management
User Needs for Improving Tools and Information
US Army Corps of Engineers
January 2011

Global Climate Change - CW's Activities

- Incorporating Sea Level Change into CW's Program
  - ✓ EC 1165-2-211 1 July 2009
- C-CAWG Climate Change Agency Water Group
  - ✓ Collaboration of Federal agencies – grew out of work in the west.
  - ✓ Key agencies: USACE, USGS, BurRec, NOAA
- CEQ/OSTP White House Working Groups (WG's): Adaptation to GCC
  - ✓ WG's on Science, Adaptation Processes, Water, & International Resiliency
- Adapting Corps Projects to GCC – FY 2010
  - ✓ National Vulnerability Stress Tests, Policy Development, Pilot Projects
  - ✓ Non-stationarity paradigm - New methods for hydrologic frequency analysis
- USACE Carbon Footprint and Carbon Mitigation Strategies
- ARRA - Partnership w/BuRec, DOE, Santa Clara University on creation of national repository for downscaling climate change projections
  - ✓ Public Access Archive and Website w/above partners & TNC, University of Washington
- U.S. Global Change Research Program - Federal Agency Collaboration

CEQ Interagency Climate Change Working Groups

- Objective: To evaluate the capabilities of the Federal government to respond to the impacts of climate change on various critical sectors, institutions, and agency mission responsibilities.
- Five original working groups:
  - Adaptation Science Inputs for Policy
  - Agency Climate Change Adaptation Process
  - Water
  - International Resilience
  - Insurance
- Seven additional work groups added later.

Corps
ers

Thank You

- Questions?
- Discussion